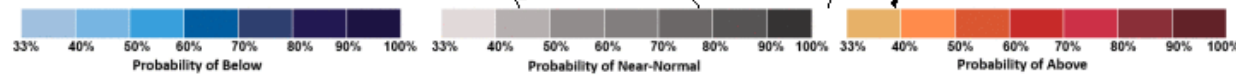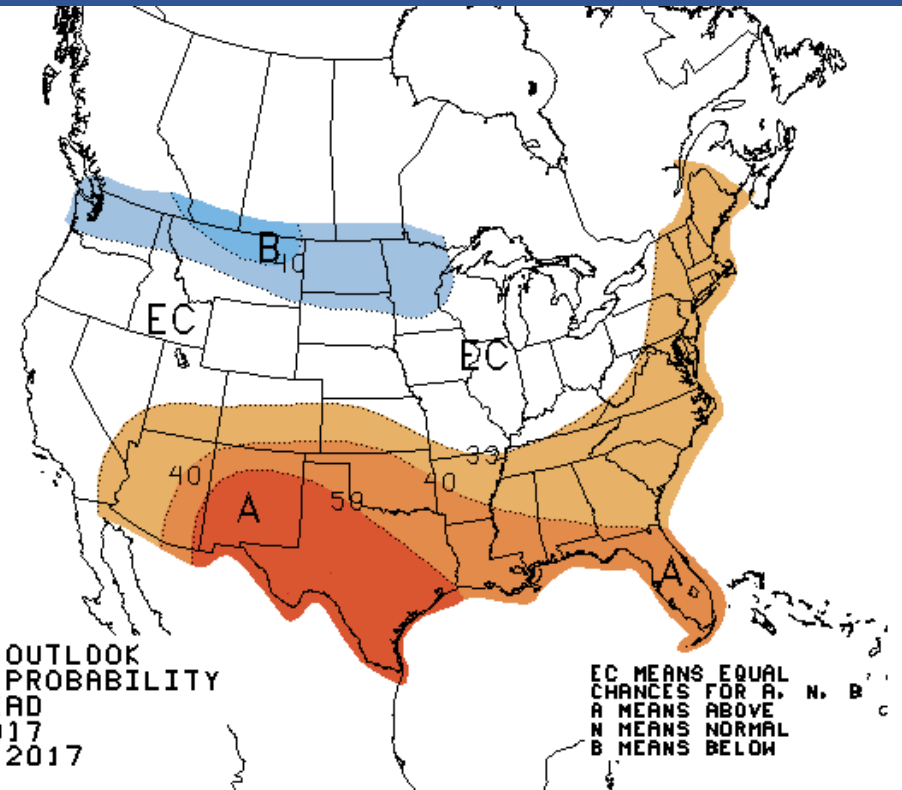# California-Nevada Drought Early Warning System Drought and Climate Outlook Webinar January 23rd, 2017
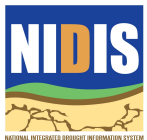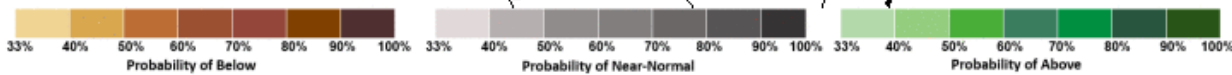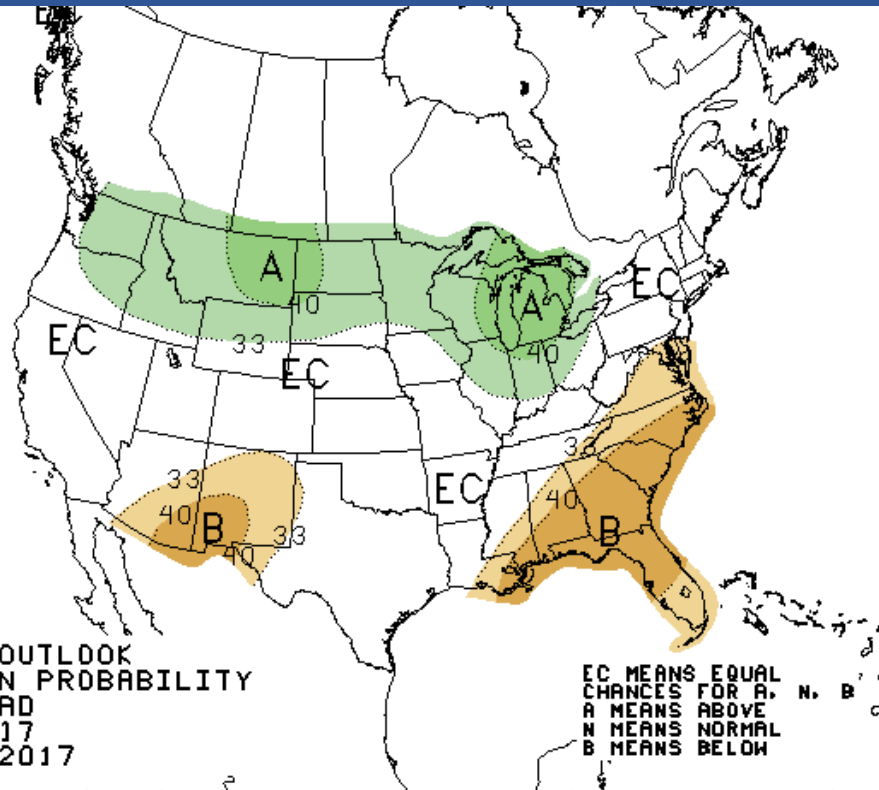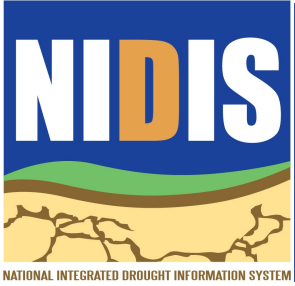
National Integrated Drought Information System (NIDIS)

- **Provide a better understanding of how and why droughts affect society, the economy and the environment.**

- **Improve accessibility, dissemination and use of early warning information for drought risk management.**

- **Build off of a network of regional Drought Early Warning Systems (DEWS) to create a National Drought Early Warning System.**

PACIFIC NORTHWEST DEWS

MISSOURI RIVER BASIN DEWS

MIDWEST DEWS

CALIFORNIA-NEVADA DEWS

INTERMOUNTAIN WEST DEWS

SOUTHERN PLAINS DEWS

COASTAL CAROLINAS DEWS

APALACHICOLA-CHATTAHOOCHEE-FLINT DEWS
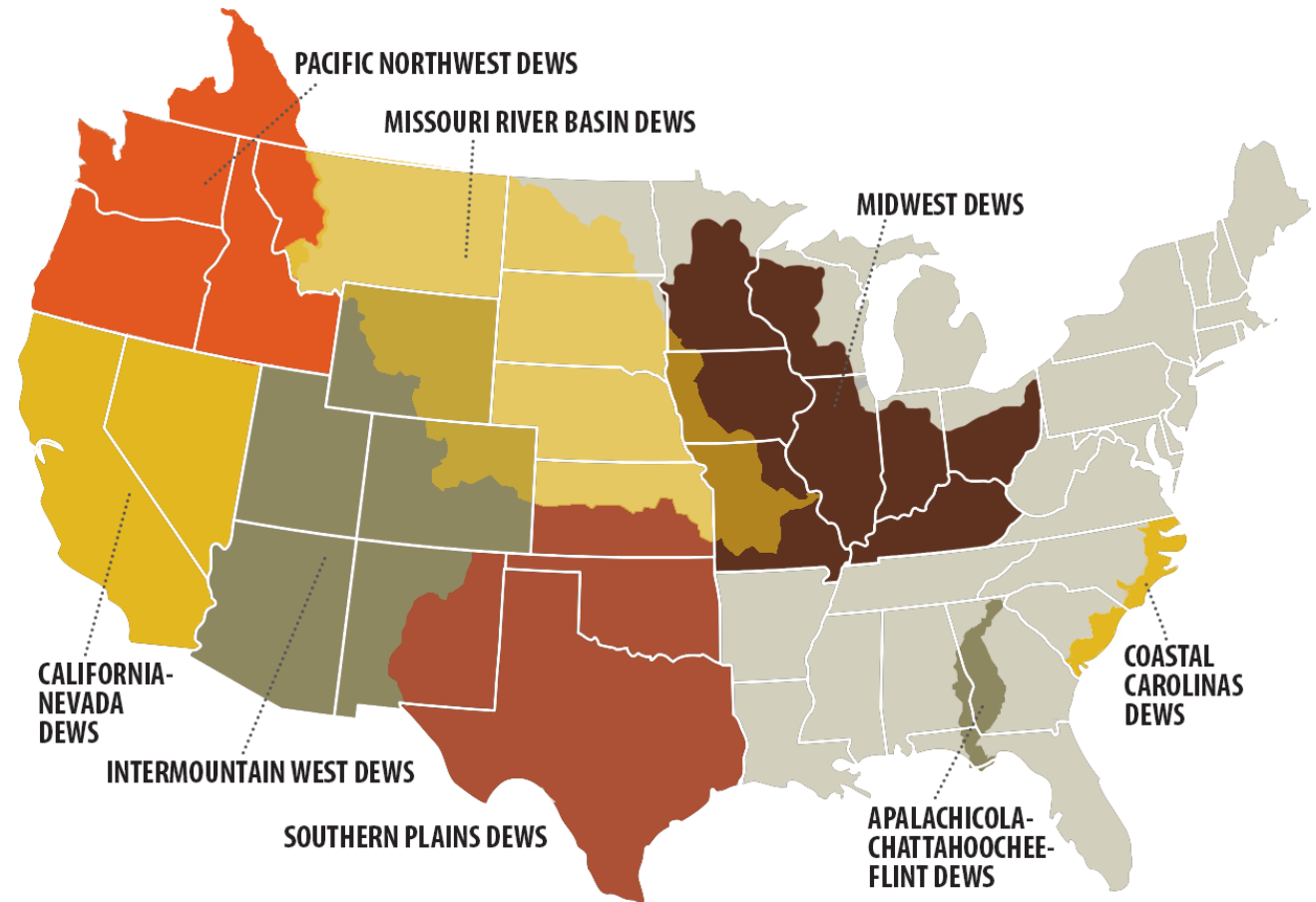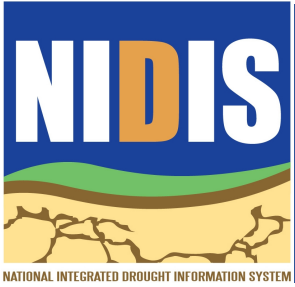
California-Nevada Drought Early Warning System (DEWS)

What is a DEWS?

A DEWS utilizes new and existing partner networks to optimize the expertise of a wide range of federal, tribal, state, local and academic partners in order to make climate and drought science and impact data readily available, easily understandable and usable for decision makers; and to improve the capacity of stakeholders and economic sectors to better monitor, forecast, plan for and cope with the impacts of drought at all spatial and time scales.

- **New CA-NV DEWS builds off**
  - Original CA DEWS (est. 2010)
  - Gov. Sandoval's Nevada Drought Forum (2015)
- **CA-NV DEWS Strategic Plan under development**

https://www.drought.gov/drought/dews/california-nevada

California-Nevada Climate Applications Program (CNAP)

- **Climate information for decision-makers in California and Nevada**

- **Upcoming:**
  - **Seasonal Forecasting Two-Pager**
  - **Feb 9th S. California Winter Status Update in San Diego**

CNAP
California-Nevada Climate Applications Program
A NOAA RISA team

@CnapRisa

cnap.ucsd.edu

CNAP
California-Nevada Climate Applications Program
— A NOAA RISA —

SUB-SEASONAL TO SEASONAL FORECASTING
NOVEMBER 2016

What is Seasonal to Sub-Seasonal (S2S) Forecasting?

Although weather forecasts at a few day time ranges are now widely used in our everyday lives, forecast at longer lead times, 2 weeks to 12 months, often referred to as **sub-seasonal to seasonal (S2S) forecasts** are needed for decision making especially in water resources, energy and agriculture sectors. A recent National Academy of Science (2016) report offered a vision that S2S forecasts in the future could become more widely used, but the advances required depend upon dedicated research and more computing resources.

The forecast **skill** (quantitative performance measure of forecasts) is calculated using one or more different formulations. The skill varies with season, with region, with the particular variable that is being predicted (e.g. temperature, precipitation), and with different properties of a forecast including lead-time and time scale (e.g., daily, weekly, monthly average; see Figure 1). Different kinds of forecasts shown in Fig. 1 employ different methods and data sources in order to make best use of the sources of the predictability. Weather forecasts, which largely depend on initial conditions of the atmosphere have poor forecast skill beyond 1-2 weeks. Since atmospheric conditions can change rapidly, the influence of the initial conditions declines with time.
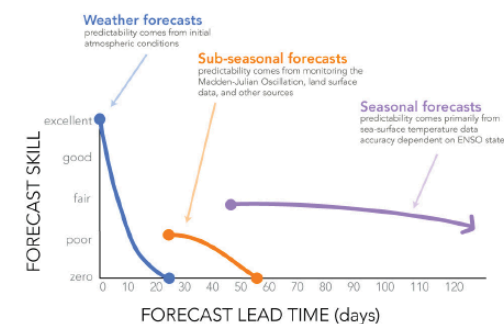
Figure 1. Qualitative behavior of forecast skill by forecast lead time (days) and by type of forecast (weather, sub-seasonal, seasonal). Source: http://iri.columbia.edu/news/qa-subseasonal-prediction-project/

FORECAST PERFORMANCE

Forecast **skill** is a measure of the performance of a forecast relative to a given standard. Often, the standard used is the long-term (30-year) average - called the climatology - of the parameter being predicted. Thus, skill scores measure the improvement of the forecast over the climatology. CPC uses the Heidke skill score (Fig. 2) - the ratio of (a) the difference between how many more times a forecast ends up matching the later observations than would be expected at random, to (b) the total number of forecasts minus the number of correct forecasts that would be expected by chance - as a measure of how well a forecast did relative to a randomly selected forecast. A score of 0 means that the forecast did no better than what would be expected by chance. A score of 100 depicts a "perfect" forecast and a score of -50 depicts the "worst possible" forecast.

Temperature forecasts generally have more skill than the precipitation forecast (Fig. 2, and example from December 2015-February 2016 in Fig. 3), as does winter precipitation than summer precipitation (Kirtman et al. 2014). The increased skill in the temperature and winter precipitation forecast lies inherently in the regional scale of controls on these climate and weather processes. As forecast lead times increase, so does forecast uncertainty. We are not only limited by errors in initial conditions and our current understanding of the climate processes involved but the chaotic nature of the global climate system that grows with time.
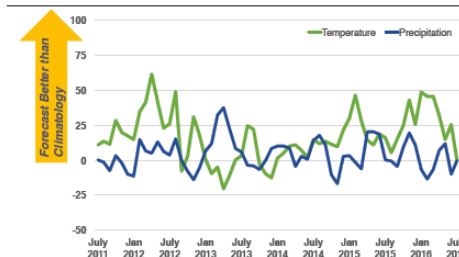
Figure 2. Heidke skill scores from the past 5-years for temperature and precipitation for the continental US. Data for these figures can be found at http://www.cpc.ncep.noaa.gov/products/verification/summary/index.php?page=tutorial

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Alex Tardy - alex.tardy@noaa.gov

Today's Webinar Agenda

- **California-Nevada Drought & Climate Status Update –** *Dan McEvoy (WRCC, DRI)*

- **CA & NV River & Reservoir Status –**
  Cindy Matthews (NWS Sacramento) & Tim Bardsley (NWS Reno)

- **ENSO: Recent Evolution, Current Status & Predictions -** *Andrea Bair (NWS)*

- **Snow Drought –** *Ben Hatchett (DRI)*

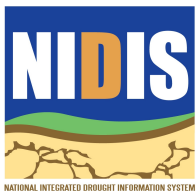*Questions will be answered at the end, please type questions in the chat box*
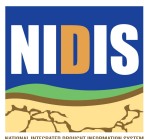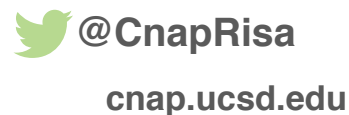
Questions & Answers

- *Please type questions in the chat box.*

- *Please fill out our 3 question survey at the end of the webinar.*

- *Next webinar: March 27, 2017*

- *Contact us if you would like more info or to be more involved with the DEWS.*

NIDIS
NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

CNAP
California-Nevada Climate Applications Program
A NOAA RISA team

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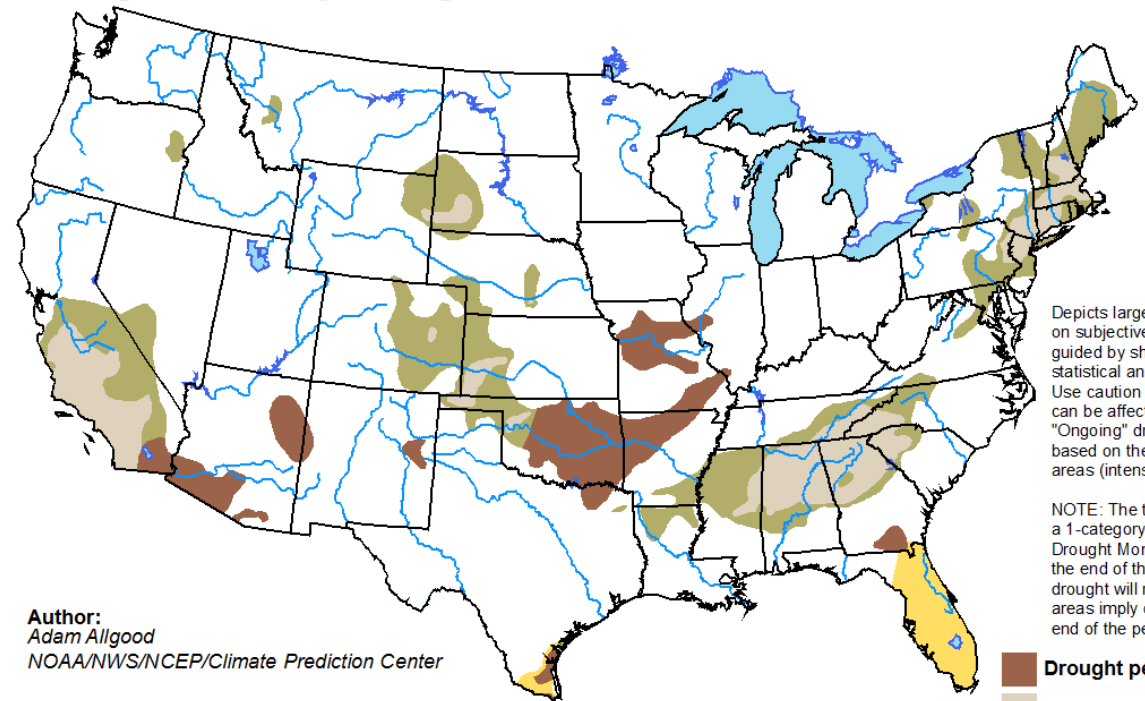
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www.drought.gov

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U.S. Seasonal Drought Outlook
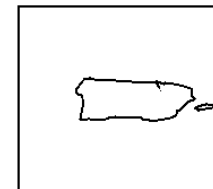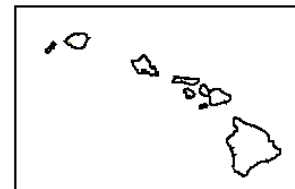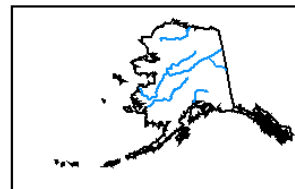### Drought Tendency During the Valid Period

Valid for January 19 - April 30, 2017
Released January 19, 2017

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author:
Adam Allgood
NOAA/NWS/NCEP/Climate Prediction Center

■ **Drought persists**
■ **Drought remains but improves**
■ **Drought removal likely**
■ **Drought development likely**

http://go.usa.gov/3eZ73